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VI. *On thirty-one Species of Marine Planarians, collected partly by the late* Dr. Kelaart, *F.L.S., at Trincomalee, and partly by* Dr. Collingwood, *F.L.S., in the Eastern Seas. By* Dr. Collingwood.

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Read March 18th, 1875.

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I.

The species of Planarians which I am about to lay before the Society were, as far as I was concerned, the fruit of many searches upon rocky shores of the coast of China, Borneo, Singapore, &c., and represent a considerable amount of labour near low-water mark in turning over stones, pieces of coral, &c. in such situations. The little animals in question, although extremely interesting, are all more or less minute; and it requires not only a sharp but an educated eye to discover them; for so delicate are they, and often so thin in texture, that out of the water, and adhering to a more or less muddy or weed-grown stone, it is by no means easy to detect them. It must not be understood, however, that these searches were unrewarded except by the comparatively small number of specimens or new species here recorded. Many other animals of interest divided the attention, as, for instance, nudibranchiate Mollusca, of which a number of new species await the notice of the Society, and other no less interesting creatures. The Planarians in many respects rival the Nudibranchs in gracefulness of form and beauty of colouring; but they are even more delicate than the latter. When a small spot of colour upon the under surface of a stone betrays the presence of one of these little animals, a camel's-hair brush is necessary to dislodge it safely; and a bottle of salt water must be at hand, into which to transfer the prize.

It may be thought that a dozen species is but a small number to reward one's labour on coasts which are supposed to abound with unknown forms of animal life. But a good deal of experience in shore-hunting on our own coasts prepared me for the fact, which I found amply corroborated on foreign shores, that we must not look for a large number of species at any one locality, unless the same locality is examined many times, and at different seasons of the year—conditions not always, or, indeed, often practicable. These little organisms appear to be sporadically distributed over wide areas. They are seldom met with gregarious; and three or four species captured upon any given occasion might be reckoned a prize more than ordinarily satisfactory.

Although, however, I never lost an opportunity of examining a shore when I could do so towards low tide, the opportunities for such rambles were necessarily limited.

And yet, although they appeared to be so sparsely distributed, a fact would come to light every now and then which seemed to point out that they were very abundant in the aggregate. For instance, a *single* visit to a certain spot would perhaps result in the discovery of some minute organism identical with one found on another occasion at a point separated perhaps by a hundred miles from the first-mentioned locality, or, as was the case in some instances, by the whole extent of the China Sea. How was it that I should stumble upon such an inconspicuous organism a second time at a spot so distant from the first, unless they were abundantly distributed through the intermediate spaces? Doubtless an explorer at the same places would still find many new forms, and leave yet many more for a successor.

With regard to the Planarians collected by the late Dr. Kelaart, and included in this collection, it is necessary that I should say a few words concerning how they came into my possession. The late Mr. Albany Hancock, of Newcastle-on-Tyne, hearing from me, in the course of correspondence, that I had collected some marine Planarians which appeared to be new, informed me that he had in his possession a number of drawings of similar animals made by Dr. Kelaart (formerly a Fellow of this Society) from specimens collected by himself in Ceylon, and principally at Trincomalee. These drawings were briefly characterized by him in a paper "On some new and little-known Ceylon Invertebrata," published in the Journal of the Ceylon branch of the Royal Asiatic Society. Part of this paper was printed in the 'Annals of Natural History' for 1859; but the portion relating to the Planarians was not so published; nor, need I say, were the drawings published at all. Dr. Kelaart issued a 'Prodromus Faunæ Zeylanicæ,' a portion of which is in the Society's Library, and which contains the description of the Planarians here figured; but I have nowhere met in the literature of the Planarians with any reference to either of these publications, which appear to be unknown. Mr. Hancock therefore suggested that if I could publish Kelaart's species along with my own, they would, as he expressed it, "make a very interesting monograph on the subject—would, in fact, make a valuable contribution towards the history of these little-known animals of the eastern seas." He therefore sent me the drawings, which, regarding them as a testament jointly from Dr. Kelaart and Mr. Hancock, both deceased, I have accordingly submitted to a careful examination, and done my best to distribute them according to the genera and species of the best classification. I may say that, with Mr. Hancock, I consider these drawings are sufficient for identification; but they are unaccompanied by details, and the descriptions of them are brief. This is to be regretted, since the value of such drawings depends no less upon the accuracy of the verbal descriptions taken from the living animals than upon the correctness and minuteness with which they are depicted. Unfortunately the animals are so extremely perishable and delicate, that no means yet devised can possibly exhibit them after death in any thing approaching to their natural appearance or beauty of form and brilliancy of colouring. Good drawings and accurate descriptions, therefore, are of the utmost value and importance; and either one without the other is consequently of

impaired value. Of my own drawings I can, of course, vouch for the faithfulness. They were always taken from the living animal while in health and activity; and any thing striking and remarkable could not fail to be noticed and recorded.

The term *Planaria*, which was at first applied to these animals as a generic name for them all, has been long since restricted to a small division of them which is not marine. Linnæus, Pallas, Lamarck, and Cuvier placed them among parenchymatous Entozoa; but the investigations of Dugès, von Baer, Quatrefages, and others have by degrees raised them to their proper and natural position. This is now assigned to them under the Turbellarian Annelids. The genera described by Ehrenberg and De Quatrefages out of the old genus *Planaria* have in turn for the most part been split up or given place to more recent classification. I have endeavoured to assign positions to the present species under the arrangement of Diesing ('Systema Helminthum'), as revised by W. Stimpson in his "Prodromus descriptionis animalium evertebratorum" of the South-Pacific Federal Expedition, under Capt. Jno. Rodgers (Proc. Acad. Nat. Scien. Philad. 1857, p. 19 &c.). Stimpson enumerates thirty-eight genera of Turbellaria Dendrocœla (Max Schultze, Wiegm. Arch. 1849, p. 292), including several new genera resulting from that expedition. Of these thirty-eight genera, eight are fluviatile, four terricolous, one inhabits brackish water, and one is pelagic. The remaining twenty-four consist of ordinary marine genera, under which group the present species would be all included. I have ventured to constitute a new genus of two of the Ceylon species, from a character which does not appear to be shared with any of those previously described. Inasmuch, however, as all the Ceylon species have already been named by their collector and delineator, I shall of course adopt his specific terms, only inserting them in what appears to me to be their proper generic group.

The marine Turbellaria Dendrocœla are for the most part flat, thin, soft, and delicate animals, remarkable for their beautiful colours and often graceful forms and movements. They have usually a pair of tentacles, these occasionally being mere folds or ear-like projections of the anterior margin (Euryleptidæ)—sometimes true tentacles, situated occipitally (Stylochidæ), or even dorsally, in which case they are retractile (Planoceridæ). In some families, however, tentacles are entirely absent (Typhloleptidæ and Leptoplanidæ). The margin is usually ample, and much folded or puckered, which is very noticeable when the animal is at rest; but when in motion, this ample pallium is gracefully waved in a vertical direction, and aids greatly such species as are natatory in swimming, which they effect with ease and rapidity. They possess either two genital apertures (subtribe *Digonopora*), as is the case with all the present species, or only a single one (subtribe *Monogonopora*), as is the case with the true Planariadæ. The mouth is variously situated on the median line of the under surface, and is in turn antecentral, subcentral, or postcentral; and the dendriform gastrovascular ramifications are often more or less visible upon the under surface.

One of their most peculiar characteristics consists of the eye-spots, small black specks of varying size and position, sometimes clustered into congeries of a symmetrical form, and sometimes scattered over the anterior and marginal portions of the upper surface, or on the tentacles. These eye-spots, in some cases at least, consist of a highly refracting

spherical body (crystalline), surrounded with pigment; and they are always situated in a part which is free from the usual pigmentary matter of the animal, and where the skin is reduced to a minimum of thickness (Baer). In any case they can but very imperfectly perform the function of vision; and in one family (Typhloleptidæ) they appear to be altogether absent *. Nevertheless these animals all seem to avoid the light, by concealing themselves under stones and in situations where no light can reach them.

Their ova are deposited in thin flakes upon sea-weeds and stones, and in appearance are not unlike those of the Nudibranchs, for which at first sight they might be mistaken. They resemble these mollusks also in their habit of floating, back downwards, upon the surface of the water. Nor do the resemblances end here; for some genera of the Eurylepidæ are provided with numerous papillæ, more or less covering the whole upper surface, after the manner of an *Eolis*, which character earned for them the generic name of *Eolidiceros* from De Quatrefages.

It has often been said, and is copied from one book into another, that these animals have the power of spontaneous fission, by means of which two individuals are produced from one. I can only say that, of the numerous specimens I have met with, kept alive, and carefully watched, I never saw any thing like this process take place in any instance. Still I cannot assert that it does not happen.

It is worthy of remark that among the 19 species of Dr. Kelaart, no less than 11 appear to be referable to the genus *Eurylepta* (Hemp. and Ehrenb.), while of my own 12 species only one is of that genus. Not one of Kelaart's claims rank under Quatrefages' old genus *Proceros*, in which one fourth of my own species occur. In each collection is found a new genus of Euryleptidæ; and the whole of the 31 species are included under one subtribe—*Digonopora*, or monœcious Turbellaria.

II.

(Characters of two new genera of Eurylepidæ.)

TURBELLARIA DENDROCŒLA.

Genus Acanthozoon, Coll.

Caput subdiscretum, tentaculis parvis approximatis. Corpus supra spinulis brevibus nigris ubique instructum.

Thysanozoon,

Acanthozoon, *Proceros*,

Eurylepta.

Genus Sphyngiceps, Coll.

Corpus læve, caput discretum, tentaculis magnis subdistantibus; ocelli occipitales et capitales.

Proceros,

Sphyngiceps,

Eurylepta.

* With regard to the eye-spots, structurally and as supposed organs of vision, consult H. N. Moseley's remarks thereon, "Anat. and Histol. Land-Planarians of Ceylon," Proc. Roy. Soc. 1873, p. 172 &c.

III.

(Synopsis of the Genera and Species described and figured in the present Paper.)

[*Note.*—Diesing's main divisions were founded upon the presence or absence of tentacles; but Stimpson pertinently remarks that such a division separates allied forms, such as *Stylochus* and *Leptoplana*, while widely separated ones, such as *Eurylepta* and *Planaria*, were approximated. In view of this I therefore follow Stimpson in founding the subtribes upon the presence or absence of a second genital aperture, instead of the mere presence or absence of tentacular appendages.—C. C.]

TURBELLARIA DENDROCŒLA.

(Tubus alimentarius dendritice ramosus.)

Subtribus I. Digonopora. Two genital apertures.

(All the species are included in this subtribe.)

Family EURYLEPTIDÆ.

Genus Thysanozoon, Grube.

1. Thysanozoon Alderi, *Coll.* Labuan.
2. Thysanozoon Allmanni, *Coll.* Singapore.
3. Thysanozoon auropunctatum, *Kel.* Aripo.

Genus Acanthozoon, Col[1]., n. g.

4. Acanthozoon armatum, *Kel.* Ceylon.
5. Acanthozoon papilio, *Kel.* Ceylon.

Genus Sphyngiceps, Coll., n. g.

6. Sphyngiceps lacteus, *Coll.* Singapore.

Genus Proceros, Quatref.

7. Proceros concinnus, *Coll.* Labuan.
8. Proceros Hancockanus, *Coll.* Singapore.
9. Proceros Buskii, *Coll.* Singapore.

Genus Eurylepta, Hemp. & Ehren.

10. Eurylepta fusca, *Kel.* Ceylon.
11. Eurylepta atraviridis, *Kel.* Ceylon.
12. Eurylepta undulata, *Kel.* Ceylon.
13. Eurylepta violacea, *Kel.* Ceylon.
14. Eurylepta dulcis, *Kel.*
15. Eurylepta purpurea, *Kel.* Ceylon.
16. Eurylepta viridis, *Kel.* Ceylon.
17. Eurylepta affinis, *Kel.* Ceylon.
18. Eurylepta cerebralis, *Kel.* Ceylon.
19. Eurylepta striata, *Kel.* Ceylon.
20. Eurylepta zeylanica, *Kel.* Ceylon.
21. Eurylepta Kelaartii, *Coll.* Singapore.

Family TYPHLOLEPTIDÆ.

Genus Typhlolepta, Oerst.

22. Typhlolepta Byerleyana, *Coll.* Pulo Barundum, west coast of Borneo.

Family LEPTOPLANIDÆ.

Genus Centrostomum, Diesing.

23. Centrostomum ocellatum, *Kel.* Ceylon.
24. Centrostomum punctatum, *Kel.* Ceylon.

Genus Elasmodes, Le Conte.

25. Elasmodes obtusus, *Coll.* Singapore.

Genus Leptoplana, Hemp. et Ehr.

26. Leptoplana patellensis, *Coll.* Simon's Bay.
27. Leptoplana aurantiaca, *Coll.* Singapore.

Family STYLOCHIDÆ.

Genus Stylochoplana, Stimpson.

28. Stylochoplana elegans, *Kel.* Ceylon.
29. Stylochoplana meleagrina, *Kel.* Ceylon.

Genus Stylochopsis, Stimpson.

30. Stylochopsis malayensis, *Coll.* Pulo Barundum, west coast of Borneo.

Family PLANOCERIDÆ.

Genus Planocera, Blainv.

31. Planocera thesea, *Kel.* Ceylon.

IV.

(Descriptions of the Marine Planarians collected in the Eastern Seas by Dr. Collingwood, F.L.S., and delineated in the accompanying figures.)

1. *Thysanozoon Alderi.*

Length $2\frac{1}{4}$ inches; breadth $1\frac{1}{2}$ inch.

Body thin, with very irregular margin, amply folded and puckered.

Upper surface of a general light brownish colour, with a narrow, pale external margin, within which is a broad, black border, somewhat shaded and marbled. Down the median line for about three quarters of its extent runs an irregular, black marbling; a faint marbled pattern of pale brown is diffused over the general surface; and a lens discloses also a fine ramification of a darker tinge throughout.

The whole upper surface is studded with small papillæ of a conical form, the footstalks of which are pale, and the distal extremities orange. Many of these papillæ

arise from an elevated white spot or tubercle, such tubercles producing only one papilla each; and other papillæ exist upon the black margin, as well as on the general surface.

Under surface whitish, edged with black, the part answering to the black marbled line on the dorsum being here opaque white.

Head blackish, angular, raised somewhat above the general plane of the body, flexible, and having two projecting angles or folded tentacles.

This was a very beautiful and striking animal, looking as if studded with golden beads. It swam freely, with a graceful vertical vermicular movement of the ample sides.

One was found under stones about two feet under water at low tide, upon a reef of the island of Labuan, coast of Borneo, on August 22. I have great gratification in naming it after the late Mr. Joshua Alder, of Newcastle, a gentleman with whom I was long in correspondence, and from whom, though we never met, I always received uniform kindness and urbanity.

Fig. 1: *a*, general appearance of upper surface; *b*, head and tentacles; *c*, portion of upper surface, enlarged, showing papillæ; *d*, a papilla; *e*, a papilla-bearing tubercle.

2. *Thysanozoon Allmani*, Coll.

Length $2\frac{1}{10}$ inches; breadth $\frac{3}{4}$ inch.

Body translucent, papillose.

Upper surface light brown, becoming darker towards the margin, and with an irregular edging of opaque white all round, excepting the head. An elevated ridge runs along the median line of the dorsum.

The whole upper surface is covered with clavate and pointed papillæ, of a deep brown colour, and varying in size, the smallest being the lightest-coloured and most numerously clustered, and occurring along the median ridge.

Under surface grey, darkening to deep brown at the sides, and edged with opaque white.

Head with two long tentacles, often thrown back, and presenting the appearance of hare's ears. Tentacles dark brown, tipped with white. Two minute white tentacles are situated in front of the head, beneath the hare-like ones.

Eye-spots situated in a light-coloured spot immediately posterior to the head, in a double cluster, consisting of two small crescentic patches of minute black spots.

A splendid species, the edges much corrugated, unless the animal is in full movement, when the folds almost disappear. It swims freely, with a graceful serpentine movement, and crawls with moderate rapidity and with an undulating movement. When at rest the animal assumes a nearly circular form, with numerous marginal folds.

Two specimens found at Singapore, west of the harbour, under pieces of dead coral, on the beach between tide-marks, Nov. 22nd.

I have much pleasure in connecting this species with the name of the President of this Society, so well known for his researches among the Invertebrate division of animals.

Fig. 2: *a*, animal in movement (dorsal surface); *b*, papillæ, large and small, magnified; *c*, eye-spots (magnified).

3. *Sphyngiceps lacteus*, Coll.

Length $\frac{7}{10}$ inch ; breadth $\frac{1}{4}$ inch.

Body graceful in form, semitransparent.

Upper surface cream-coloured, irregularly spotted with sparse and minute black dots, and having faint marbling on either side of the *median ridge*, which is very conspicuous. Margin irregularly blotched with red, and the whole body edged with a narrow black line.

Under surface whitish, edged with red blotches and a black streak as on the upper side, but somewhat less distinct. A broad streak of white occupies the anterior third of the median line.

Head small and narrow, but rendered very conspicuous at times by its being raised up, so that the median ridge is thus very much elevated in front. Head furnished with two folded tentacles.

Eye-spots round, immediately posterior to the head, which has in front of it a pair of larger single spots.

This is a remarkably graceful little animal, crawls with great rapidity, and with a gliding movement, then suddenly throws its head back, and, leaving the side of the vessel, swims with a graceful serpentine movement, sometimes very fast ; floats also on its back on the surface of the water. It has the habit of throwing back its head very far, and remaining in that position (*rampant*, as it were), at which time the head and anterior portion of the body become narrow and tubular, giving the appearance of a *neck*. When at rest it expands laterally, becoming in shape as broad as long.

One specimen found under a coral block, west of Singapore Harbour, at low water, on Nov. 22nd.

Fig. 3 : *a*, animal in motion ; *b*, head, enlarged, showing eye-spots.

4. *Proceros concinnus*, Coll.

Length $\frac{5}{8}$ inch.

Body narrow, entire, without marginal foldings.

Upper surface cream-colour, approaching to yellow, with an edging of blue all round, composed of small and larger spots running into one another. A similar blue streak runs along the median line from a little behind the head to some distance from the posterior extremity, through about three quarters the length.

Under surface cream-colour, similarly edged with blue, a brownish streak running through the whole median line, the arbusculiform alimentary tube of a straw-colour, occupying the anterior third.

Head with two folded tentacles.

Eye-specks conglomerated in a small round spot midway between the head and the blue median line.

A very pretty and lively species, particularly fond of floating on its back or crawling rapidly along. I obtained one specimen on a reef at Labuan, near low-water mark, and

a second at Pulo Daak, a small island between Labuan and the mainland of Borneo, August 25th.

Fig. 4: *a*, animal extended, upper surface; *b*, animal extended, under surface; *c*, eye-spots.

5. *Proceros Hancockanus*, Coll.

Length $1\frac{4}{10}$ inch; breadth $\frac{6}{10}$ inch.

Body velvety, opaque.

Upper surface of a deep velvety brown, edged with a double margin of equal widths, the inner deep orange, the outer opaque white. Along the centre of the back was a slightly elevated ridge.

Under surface grey, darkening towards the sides.

Head small, tentacles simply folded, long and graceful, the orange margin disappearing, and the white alone being prseent.

Eye-specks in an oval elongated cluster, immediately posterior to the head.

A very beautiful species, no less from its rich colour than from its active movements. Swimming by an undulating movement, it also floated on its back on the surface of the water, after the manner of the Nudibranchiata. It crawled slowly, and with an undulating motion. In texture it appeared somewhat translucent, and when suddenly disturbed became much paler, as though by a sudden contraction of the tissues. In one specimen a temporary slit appeared, occupying the middle third of the dorsal ridge, rounded anteriorly, wedge-shaped posteriorly, through which slit the internal organization was clearly visible. The slit remained open one day, and afterwards closed. The intestines appeared sometimes as though protruding through this slit, which was not exhibited by a second specimen. On placing one of these animals in glycerine, it immediately discharged a quantity of a brownish-coloured fluid, and contracted considerably in bulk.

Two specimens were obtained on succeeding days from among stones and old coral blocks, between tide-marks, west of Singapore Harbour, Nov. 21st.

This species I have much pleasure in connecting with the name of the late Mr. Albany Hancock, the coadjutor of Alder, from whom, although we never met, I received many kindly letters up to near the time of his lamented decease.

Fig. 5: *a*, the animal in motion, exhibiting the open dorsal fissure; *b*, the cluster of eye-specks.

6. *Proceros Buskii*, Coll.

Length $\frac{1}{2}$ inch; breadth $\frac{1}{4}$ inch.

Body opaque, flat, smooth.

Upper surface rich velvety olive-green, edged with pale yellow.

Under surface dark grey, the dendritic marking whitish, and occupying the anterior half of the median line.

Head with two folded earlike antennal projections.

Eye-spots in a circular cluster, difficult to detect owing to the dark colour of the animal, and situated upon a ridge formed by the elevation of the antennal head.

A very handsome active species, crawls rapidly, at the same time throwing back its head, and floats, back downwards, on the surface of the water. One specimen only, found under a stone, and upon a small grey incrusting sponge, between tide-marks in Singapore Harbour, west of the town, December 3rd.

I have named this species after my friend Mr. Busk, than whom no one has been more assiduous or successful in his investigations among the lower forms of Invertebrata.

Fig. 6 : *a*, animal at rest, dorsal surface ; *b*, head.

7. *Eurylepta Kelaartii*, Coll.

Length $\frac{4}{10}$ inch ; breadth $\frac{1}{4}$ inch.

Body small, smooth, thin.

Upper surface mottled dark purple, the mesial line presenting a slightly elevated ridge of a darker colour.

Under surface the same colour as the upper, but paler.

Head small, with minute ear-like processes.

Eye-spots minute, roundish.

An actively crawling creature, occasionally throws its head back. Two specimens were found in Singapore Harbour, west of the town, under stones, and apparently feeding upon a small incrusting sponge. One of these specimens was of a lighter lake colour. December 3rd.

As out of the 19 species delineated by Dr. Kelaart I have referred no less than 11 to the genus *Eurylepta*, while of my own 12 this is the sole one of that genus, I have dedicated it to him—a compliment to his memory which his industry in this as well as in other branches of zoology well deserves.

Fig. 7 : *a*, animal in motion ; *b*, eye-spot, magnified.

8. *Typhlolepta Byerleyana*, Coll.

Length $\frac{3}{4}$ inch ; breadth $\frac{3}{8}$ inch.

Body smooth, thin, and the lateral parts very ample and puckered.

Upper surface beautifully marbled with light-brown rings, including roundish spaces of a whitish colour, smaller rings being between the interstices of the larger ; most crowded and darkest in colour along the median line, paler and more delicate towards the sides.

Under surface of a pale grey, the dendritic marking in the centre of an opaque white.

This very beautiful species I obtained from under a piece of coral on Pulo Barundum, off the west coast of Borneo. Not having a brush at hand, I had great difficulty in dislodging it from the crevices. Its movements were very contorted, and it did not exhibit much activity. One specimen only was procured, October 6th.

I have named this elegant species after my friend Mr. J. Byerley, F.L.S., of Seacombe, Cheshire, a gentleman who in the hardly-spared intervals of active practice has ex-

hibited the greatest interest in zoological science, and with great industry and labour compiled the ' Fauna of Liverpool.'

Fig. 8. General appearance of upper surface.

9. *Elasmodes obtusus*, Coll.

Length $\frac{6}{10}$; breadth $\frac{1}{5}$ inch.

Body thin, delicate, smooth, semitransparent, dendritic.

Upper surface pale brown, with a dark, shaded brown streak along the middle half of the median line, from which radiate delicate pale brown markings, which fade as they reach the margin.

Under surface pale, and exhibiting the radiating markings, though fainter.

Head indistinct.

Eye-spots two, somewhat crescentic, situated upon a round, white, transparent space immediately in front of the median dark brown streak.

A very lively, active, and graceful animal. When in motion and fully extended it has a broad or truncated appearance anteriorly. It crawls rapidly, floats feet uppermost, and swims gracefully and rapidly by a vertical movement of the sides of the body, which is performed by quick and sudden jerks.

One specimen was obtained in Singapore Harbour, west of the town, from beneath a stone between tide-marks, December 3rd.

Fig. 9. Upper surface of the animal.

10. *Leptoplana patellensis*, Coll.

Length $\frac{1}{2}$ an inch.

Body entire, opaque.

Upper surface cream-colour, smooth, beautifully mottled with rich light brown. A ridge runs along the median dorsal line, irregularly marked with a darker brown, from which the general mottling radiates to the margin, where it is palest.

Under surface of an opaque whitish colour, the dendritic marking occupying the middle third, of an opaque white, and surrounded with dots of the same.

Eye-spots irregular and indistinct, consisting of an oval ring at the anterior part of the median line, and on either side an irregular patch, that on the left roundish, and on the right crescentic. These spots when magnified appear roundish, but not circular, and do not present any regular figure.

This animal moves with a leech-like motion, fixing itself by its anterior and posterior ends alternately. It showed no inclination to swim or float like most of the Planarians, nor even to leave the bottom of the vessel of water in which it was contained.

Two specimens were obtained from under the mantle of a large limpet (*Patella oculus*), which I knocked off with my foot from the granite boulders of Simon's Bay, Cape of Good Hope, May 23rd.

Fig. 10 : *a*, upper surface, animal in motion ; *b*, head, enlarged, showing arrangement of eye-spots.

11. *Leptoplana aurantiaca*, Coll.

Length $\frac{3}{16}$ inch; breadth $\frac{1}{6}$ inch.

Body slender, semitransparent, entire.

Upper surface, general colour orange-chrome, with a median ridge of a pinkish colour. From this ridge radiate a number of minute dendritic processes of a bright chrome-colour, which approach the margin, where the body becomes perfectly translucent. Sparse white spots are scattered irregularly over the general surface.

Under surface similar to the upper, only paler, as though from the colour being seen through the semitransparent body.

Head. The anterior portion of the body is without a distinct head or tentacles, but notched, and apparently folded; on the left side of the notch appeared a tentaculiform process tipped with a black spot, and having also two or three small black specks in its neighbourhood.

Eye-specks in a hippocrepiform congeries immediately anterior to the pink median line; the spots few, and larger than usual compared with the smallness of the animal.

This species moves somewhat slowly, crawling like a slug, and also swims or floats upon its back, like the nudibranchs, upon the surface of the water.

I obtained several specimens between tide-marks under stone westward of Singapore Harbour in November.

Fig. 11. Upper surface of the animal.

12. *Stylochopsis malayensis*, Coll.

Length $1\frac{1}{4}$ inch; breadth $\frac{3}{8}$ inch.

Body smooth, folds ample; general colour a rich, velvety, deep brownish black, with a narrow border of deep chrome, external to which is a second narrow edge of dull white.

Under surface nearly as dark as the upper, with a central irregular line of rose-colour.

Tentacles large, separate, anterior, supporting ocelli.

One specimen found under a coral block on Pulo Barundum, west coast of Borneo, between tide-marks, Oct. 6.

Fig. 12. Upper surface of the animal.

V.

(Dr. Kelaart's description of his figures of Marine Planarians taken at Ceylon, all of which, except two, he included under the genus *Planaria*. They are therefore, in this list, referred to their proper genera.)

Genus Thysanozoon, Grube.

13. *Thysanozoon auropunctatum*, Kel.

A large species.

Upper surface, a rich violet brown, darker in the centre, and edged all round with a

border of pure white. Thickly studded with papillæ, small and conical, the bases of which are black, the apices golden yellow, and the intermediate band white.

Under surface pale purple, very dark towards the margin all round, but having the narrow white border as above.

Head furnished with two small rudimentary tentacles. Mouth situated between the middle and anterior third.

Found at Aripo, 28th February.

Fig. 13: *a*, upper surface of animal; *b*, papillæ, magnified.

Genus Acanthozoon, Coll., n. g. (see p. 86).

14. *Acanthozoon armatum*, Kel.

Length $1\frac{1}{2}$ inch; breadth $1\frac{1}{4}$ inch.

Upper surface of a dark purple colour, covered with short black spines.

Under surface pale purple, smooth.

Tentacles folded, but somewhat distinctly formed.

Fig. 14. Upper surface.

15. *Acanthozoon papilio*, Kel.

Length about 1 inch.

Upper surface yellow, covered with small black spines; margin whitish.

Under surface pale yellow.

Tentacles as in last species, black, tipped with white.

Looks very like a butterfly moving in the water.

Fig. 15. Upper surface.

Genus Eurylepta, Hemp. et Ehr.

16. *Eurylepta fusca*, Kel.

Length $1\frac{1}{2}$ inch.

Upper surface dusky brown.

Under surface paler brown.

Tentacles inconspicuous and approximated.

Fig. 16. Upper surface.

17. *Eurylepta atraviridis*, Kel.

Upper surface dark mottled green, with a darker broad streak through the whole median line. An edging of pale green runs all round.

Tentacles like the last.

Fig. 17. Upper surface.

18. *Eurylepta undulata*, Kel.

Length 2 inches.

Upper surface pale yellow, with undulating lines and spots of purplish brown, producing a marbled appearance. Margin and median line purplish.

Tentacles rudimentary.

Fig. 18. Upper surface.

19. *Eurylepta violacea*, Kel.

Length $1\frac{1}{4}$ inch; breadth $\frac{3}{4}$ inch.
Upper surface violet purple, edged with bright yellow; median line yellowish.
Under surface rose-coloured.
Tentacles rudimentary.
Ova yellowish.

This beautiful species, in a quiescent state, resembles some variety of Pansy (*Kel.*). It appears to be nearly allied to *Planaria zebra*, Leuck. See Rüppell's Atlas, t. 3. f. 1 *a*, *b*.

Fig. 19: *a*, upper surface; *b*, under surface.

20. *Eurylepta dulcis*, Kel.

Length 1 inch.
Upper surface light green, minutely spotted with reddish brown; margin white; median line brown.
Tentacles rudimentary.

Fig. 20. Upper surface.

21. *Eurylepta purpurea*, Kel.

Length about $1\frac{1}{2}$ inch.
Upper surface of a beautiful purple colour.
Under surface paler purple, darkening towards the margin.
Tentacles very small and rudimentary.

Fig. 21. Upper surface.

22. *Eurylepta viridis*, Kel.

Length about $1\frac{1}{4}$ inch.
Upper surface green, spotted with brown; margin darkly grizzled brown.
Under surface paler green.
Tentacles rudimentary, small, brown.

This species appears to be nearly allied to *Planaria limbata*, Leuck. See Rüppell's Atlas, t. 3. f. 4.—C. C.

Fig. 22. Upper surface.

23. *Eurylepta affinis*, Kel.

Upper surface purple, with yellow border.
Tentacles very small and rudimentary.

Fig. 23. Upper surface.

24. *Eurylepta cerebralis*, Kel.

Length $3\frac{1}{2}$ inches; breadth 3 inches.
Upper surface of a yellowish brown colour, and minutely streaked with fine wavy brown lines; border ample, edged with black and streaked with white.
Under surface of a delicate salmon-colour, with a narrow blackish border.
Head with rudimentary tentacles, formed by two folds of the margin; mouth large, placed on the anterior third of the lower surface; lips white.
Ova greenish white.

This was the largest specimen observed. Its colour and the ample foldings of the margin call to mind the appearance of convoluted brain-substance.

Fig. 24. Upper surface.

25. *Eurylepta striata*, Kel.

Length $2\frac{1}{2}$ inches.

Upper surface brownish purple, streaked with brown; marginal folds ample, and edged with a narrow border of dark brown.

Under surface pale orange-brown, darker towards the margin, and edged with a narrow border of brown.

Fig. 25. Upper surface.

26. *Eurylepta zeylanica*, Kel.

Length $2\frac{1}{2}$ inches; breadth $1\frac{1}{2}$ inch.

Upper surface dark purplish chocolate-brown; margin crenated, white, with an inner border of orange, and another thin one of black.

Under surface paler.

Ova white.

Apparently allied to *Eurylepta interrupta*, Stimp. (Proc. Ac. Sc. Phil. 1857, p. 26).—C. C.

Fig. 26. Upper surface.

Genus Centrostomum, Dies.

27. *Centrostomum ocellatum*, Kel.

Length 2 inches.

Animal gelatinous.

Upper surface pale yellowish brown, with dark brown ocellated spots.

Under surface pale buff.

Tentacles none.

Mouth near the centre.

Eye-spots occipital.

Ova white.

Of this and the next species Dr. Kelaart made a new genus, which he called *Penula*, the principal character of which was the absence of any form of tentacles. But this character is not that of a genus, but of a subtribe, called by Diesing *Aceridea*; and the families Typhloleptidæ, Leptoplanidæ, &c. are therein included.—C. C.

Fig. 27. Upper surface.

28. *Centrostomum punctatum*, Kel.

Length $1\frac{3}{4}$ inch.

Upper surface white, shaded and minutely punctated with reddish brown.

Under surface very delicate white, clouded with faint reddish brown.

Fig. 28. Upper surface.

These two species (particularly the first) seem to bear a great resemblance to the *Planaria gigas*, from the Red Sea, figured in Rüppell's Atlas, t. 3. f. 5.—C. C.

Genus Stylochoplana, Stim.

29. *Stylochoplana elegans*, Kel.

Length $1\frac{1}{4}$ inch.

Upper surface pale yellow, shaded with greenish brown, and dotted with black; margin black, lined with orange.

Under surface whitish, with brownish margin.

Tentacles two, small, reddish, tipped with red, occipital.

Fig. 29. Upper surface.

30. *Stylochoplana meleagrina*, Kel.

Length $1\frac{3}{4}$ inch.

Upper surface striped with broad streaks, the inner pure white, the others light purplish and whitish; the median line brownish red, edged with black; the margin waved and edged narrowly with black.

Tentacles small, oval, occipital. There are also two linear appendages on the occipital region above the eye-spots.

Fig. 30: *a*, upper surface; *b*, under surface.

Genus Planocera (Blainville).

31. *Planocera thesea*, Kel.

Length $1\frac{1}{2}$ inch.

Upper surface chocolate-brown, edged with yellow.

Under surface pale purple, darker towards the margin.

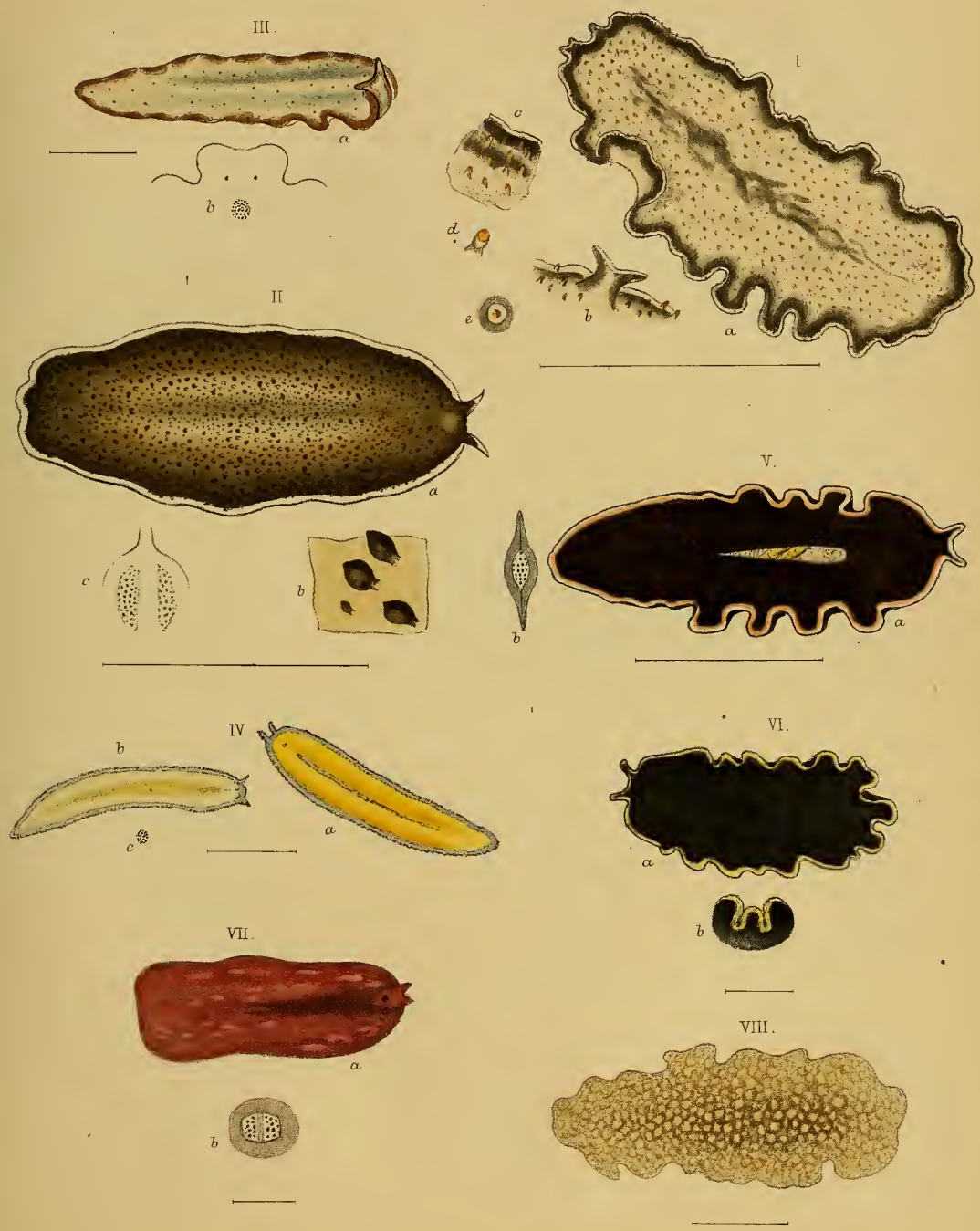
Tentacles white, tipped with red, rising from depressions or cups placed near the middle third of the body.

Mouth central.

Fig. 31. Upper surface.

[Editorial Addendum, *with* Explanation *of* Plates XVII. *to* XIX.

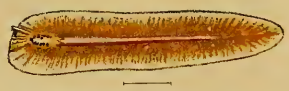
The figures in the three Plates are consecutively numbered, and correspond with the numbers and references appended at the close of each description of the species in the text. The original drawings of figs. 1 to 12 (Pl. XVII. and part of Pl. XVIII.) were designed by Dr. Cuthbert Collingwood; those of figs. 13 to 31 (part of Pl. XVIII. and the whole of Pl. XIX.) are by Dr. Kelaart. Owing to the protracted absence of Dr. Collingwood abroad, the proof sheets have not had the advantage of his revision. This has unfortunately led to a discrepancy in the lettering in the plates. It was originally intended that the author's own newly described species should be distinguished by Arabic, and Dr. Kelaart's by Roman numbers; but the artist has not carried out this minor matter of detail. The lettering in the text has not been altered to correspond with the artistic error in the plates, which were printed off before the correction of proof sheets was undertaken.

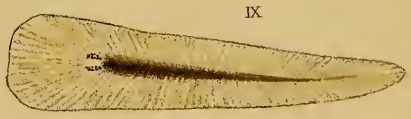


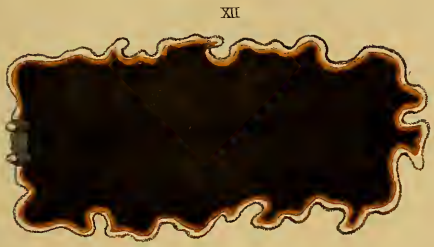
C. Collingwood del.t C. French Angas lith.

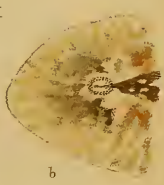
W. West & Co. imp.

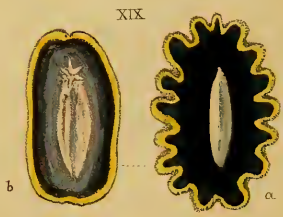
New Species of Planaria.











C. Collingwood. del.t
Geo French Angas lith.

W West & Co. imp

New species of Planaria

XXVI

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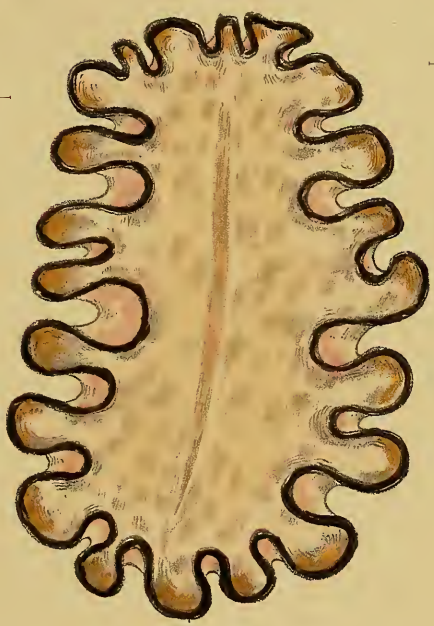

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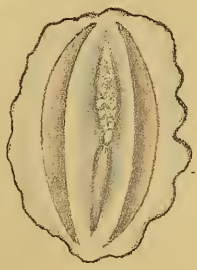

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Dr Kelaart del.et ad nat.
Geo French Angas lith.

W. West & Co. imp.

New species of Planaria.